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10/523,017	09/15/2005	Baek-Kyun Jeon	8071-155T	6430

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EXAMINER

BRIGGS, NATHANAEL R

ART UNIT	PAPER NUMBER
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2871

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/16/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/523,017

Applicant(s)

JEON ET AL.

Examiner

Nathanael R. Briggs

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 December 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 3/8/07.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments, see pages 6-8, filed 12/29/2006, with respect to the rejection(s) of claim(s) 1-11 under 35 U.S.C. § 102(e) and 35 U.S.C. § 103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of additional prior art.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. **Claims 1-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bouten (US 6,816,226) in view of Shimizu et al. (US 4,390,245).**

1. Regarding claim 1, Bouten discloses an LCD panel (see figures 1 and 4, for instance) having an insulating substrate (22) with a display area (1); and a plurality of spacers (28, 29, 30, 31) formed on the insulating substrate (22) and contacting the insulating substrate (22) to support the insulating substrate (22). However, despite the appearance of the relative sizes of the spacers in figure 4, Bouten does not *expressly* disclose wherein contact area of the spacers contacting the substrate becomes large as the spacers are located closer to a center of the display area.

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2. Regarding claim 1, Shimizu discloses an LCD (see figure 2, for instance), having spacers (4, 5) wherein contact area of the spacers (4, 5) contacting an insulating substrate (3) becomes large as the spacers (4, 5) are located closer to a center (5) of the display area (column 2, lines 40-41 and lines 46-48).

3. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the use the spacer contact areas of Shimizu in the LCD of Bouten. The motivation for doing so would have been to maintain the distance between the two substrates uniform as widely as possible by placing the largest spacers in the center, as taught by Shimizu (column 1, lines 32-35; column 2, lines 63-65). Claim 1 is therefore unpatentable.

4. Regarding claim 2, Bouten in view of Shimizu discloses the LCD panel of claim 1 (see Bouten figures 1 and 4; Shimizu figure 2, for instance), and Shimizu further discloses wherein the contact area of the spacers (4, 5) at the center of the display area (5) is equal to or less than 3.2 times the contact area of the spacers (4) closest to edges of the display area (column 2, lines 40-41 and lines 46-48). Claim 2 is therefore unpatentable.

5. Regarding claim 3, Bouten in view of Shimizu discloses the panel of claim 2 (see Bouten figures 1 and 4; Shimizu figure 2, for instance) and Bouten further discloses the LCD further having a gate wire (column 3, line 43) and a data wire (column 3, line 43) formed on the insulating substrate (22) and transmitting electrical signals such as a scanning signal and a picture signal, a thin film transistor (column 3, line 42) electrically connected to the gate wire (column 3, line 43) and the data wire (column 3, line 43) and

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serving as a switching element for controlling the picture signal, and a pixel electrode (column 3, line 51) receiving a pixel voltage for drive liquid crystal molecules (20). Claim 3 is therefore unpatentable.

6. Regarding claim 4, Bouten in view of Shimizu discloses the panel of claim 2 (see Bouten figures 1 and 4; Shimizu figure 2, for instance), and Bouten discloses the LCD further comprising red, green and blue color filters (column 3, lines 60-61) formed on the insulating substrate (22; column 3, lines 60-62). Claim 4 is therefore unpatentable.

7. Regarding claim 5, Bouten discloses an LCD (see figures 1 and 4, for instance) having two substrates (21, 22) facing each other and having a display area (1); a sealant (3) formed along a periphery of the substrates (21, 22) located external to the display area (1), having a shape of a closed loop, and supporting the substrates (21, 22); a liquid crystal layer filled in a room enclosed by the substrates and the sealant; and a plurality of spacers (28-31) formed between the substrates (21, 22). However, despite the appearance of the relative sizes of the spacers in figure 4, Bouten does not expressly disclose the spacers contacting the substrates with different contact areas to support the substrates.

8. Regarding claim 5, Shimizu discloses an LCD (see figure 2, for instance), having spacers (4, 5) contacting an insulating substrate (3) with different contact areas to support the substrates (column 2, lines 40-41 and lines 46-48).

9. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the use the spacer contact areas of Shimizu in the LCD of Bouten. The motivation for doing so would have been to maintain the distance between the two

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substrates uniform as widely as possible by placing the largest spacers in the center, as taught by Shimizu (column 1, lines 32-35; column 2, lines 63-65). Claim 1 is therefore unpatentable. Claim 5 is therefore unpatentable.

10. Regarding claim 6, Bouten in view of Shimizu discloses the LCD of claim 5 (see Bouten figures 1 and 4; Shimizu figure 2, for instance), and Shimizu further discloses wherein contact area of the spacers (4, 5) contacting the substrate (3) becomes large as the spacers (4, 5) are located closer to a center of the display area. Claim 6 is therefore unpatentable.

11. Regarding claim 7, Bouten in view of Shimizu discloses the LCD panel of claim 6 (see Bouten figures 1 and 4; Shimizu figure 2, for instance), and Shimizu further discloses wherein the contact area of the spacers (4, 5) at the center of the display area (5) is equal to or less than 3.2 times the contact area of the spacers (4) closest to edges of the display area (column 2, lines 40-41 and lines 46-48). Claim 7 is therefore unpatentable.

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. **Claims 8-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bouten (US 6,816,226) in view of Shimizu et al. (US 4,390,245), and in further view of Lee et al. (US 2003/0147038).**

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14. Regarding claim 8, Bouten discloses a method of manufacturing an LCD (see figures 1 and 4, for instance), the method having steps of forming a plurality of spacers (28-31) on one of two substrates (21, 22) having display areas (1), the spacers (28-31) located on the display area (1) of the one of two substrates (21, 22) and contacting the substrate (21, 22); applying a sealant (3) on one of the substrates (21, 22); and dropping a liquid crystal material (20) on the substrate (21, 22) applied with the sealant (3). However, Bouten does not specifically disclose a step of combining the substrates under a vacuum atmosphere; nor does Bouten expressly disclose, despite the appearance of the relative sizes of the spacers in figure 4, the spacers contacting the substrates with different contact areas to support the substrates.

15. Regarding claim 8, Shimizu discloses an LCD (see figure 2, for instance), having spacers (4, 5) contacting an insulating substrate (3) with different contact areas to support the substrates (column 2, lines 40-41 and lines 46-48).

16. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the use the spacer contact areas of Shimizu in the LCD of Bouten. The motivation for doing so would have been to maintain the distance between the two substrates uniform as widely as possible by placing the largest spacers in the center, as taught by Shimizu (column 1, lines 32-35; column 2, lines 63-65).

17. Regarding claim 8, Lee discloses a method for manufacturing an LCD (see figures 1-8, for instance) including a step of combining the substrates under a vacuum atmosphere ([0045]).

18. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the vacuum process of Lee in the method of manufacturing of Bouten in view of Shimizu. The motivation for doing so would have been to alleviate the disadvantages of the prior art cited by Lee, which includes eliminating airflow between the substrates, thereby strengthening the bond between the substrates, as taught by Lee ([0012], [0013]). Claim 8 is therefore unpatentable.

19. Regarding claim 9, Bouten in view of Shimizu and in further view of Lee discloses the method of claim 8 (see Bouten figures 1 and 4; Shimizu figure 2; Lee figures 1-8, for instance), and Shimizu further discloses wherein contact area of the spacers (4, 5) contacting the substrate (3) becomes large as the spacers (5) are located closer to a center of the display area. Claim 9 is therefore unpatentable.

20. Regarding claim 10, Bouten in view Shimizu and in further view of Lee discloses the method of claim 9 (see Bouten figures 1 and 4; Shimizu figure 2; Lee figures 1-8, for instance), and Lee further discloses steps of bonding the substrates including aligning the substrates ([0038]); evacuating a room between the substrates ([0045]); adhering the substrates using vacuum atmosphere ([0041]-[0043]); pressurizing the substrates using atmospheric pressure ([0045]). Bouten further discloses steps of attaching the substrates with the sealant (column 3, lines 28-30); and combining the substrates by hardening the sealant (column 4, lines 61-64).

21. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the substrate-bonding process of Lee in the method of manufacturing of Bouten in view of Shimizu. The motivation for doing so would have been to achieve

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quick and accurate alignment of the substrates for manufacture, as taught by Lee ([0038]). Claim 10 is therefore unpatentable.

22. Regarding claim 11, Bouten in view Shimizu and in further view of Lee discloses the method of claim 10 (see Bouten figures 1 and 4; Shimizu figure 2; Lee figures 1-8, for instance), and Shimizu further discloses wherein the contact area of the spacers (4, 5) at the center of the display area (5) is equal to or less than 3.2 times the contact area of the spacers (4) closest to edges of the display area (column 2, lines 40-41 and lines 46-48). Claim 11 is therefore unpatentable.

Conclusion


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nathanael R. Briggs whose telephone number is (571) 272-8992. The examiner can normally be reached on 9 AM - 5:30 PM Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Nelms can be reached on (571) 272-1787. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Nathanael Briggs
3/13/2007


ANDREW SCHECHTER
PRIMARY EXAMINER